

Climate-Smart Agriculture

Agriculture is an economic activity that is highly dependent upon weather and climate in order to produce the food and fiber necessary to sustain human life. Not surprisingly, agriculture is deemed to be an economic activity that is expected to be vulnerable to climate variability and change.

Climate change and affect on agriculture

Whether it be the crops we grow, the livestock we raise, or the wild plants and animals that we harvest, every organism that we rely on as a food source depends on a unique confluence of conditions that determine whether it will merely survive, deteriorate, or flourish. These environmental factors can include such things as: access to water and nutrients, temperature, the amount and periodicity of sunlight, and interactions with other organisms within the same ecosystem.

For thousands of years, each of these individual factors has tended to change only slowly or infrequently. Encouraged by this predictability, people have been able to build civilizations around specific food sources. Over time, their sustained and focused attention has led to the great advances in the science and technology of food production that allow humanity to sustain a rapidly growing population.

Climate change is no more a debate between scientists but a reality. Agriculture is highly vulnerable to climate change, and more than any other major economic sector, it will need to adapt to the changing climate. Under optimistic lower-end projections of global warming, climate change may reduce crop yields by between 10 and 20 per cent. Increasing temperatures and declining precipitation are already reducing yields of grains and other primary crops in many parts of the vast semi-arid areas where so many of the poorest reside. Increased incidence of droughts, floods and pests also lead to yield instability and a sharp increase in prices of major food crops.

The USA was in the grip of drought considered to be the worst for more than 50 years. A drought period lasting weeks in the USA during summer and too much rain in Argentina in October have affected the yields of cereals and soya beans very significantly, resulting in a rise of up to 50% in grain prices in the world market according to World Bank and soybean prices rose by almost 30 per cent from mid-June to end of July 2012.

Changes in weather patterns are going to affect agriculture with impacts differing according to region. We are now facing important decisions about which direction the future of world food supply system is going to go. Climate change affects agriculture in various ways. CO₂ levels, temperatures and climate variability and the frequency of extreme events such as heavy rain, floods and droughts will increase. The developing countries can reckon with the fist effect, because food shortage and high world food market prices are first of all a threat to food security for the world's poorest countries, and consequently a threat to social stability.

Reconstruct in organic agriculture

Organic farming is well placed to respond to challenges such as water management, soil protection, and climate change because it provides a system approach to resource efficiency and

climate action.

Organic agriculture uses local knowledge which is highly adaptive to local variations, and combines it with modern agro-ecological methods. Moreover, the high diversity on organic farms improves economic and ecological stability and increases resilience against adverse impacts of climate change.

While agriculture is strongly affected by climate change, it is also contributing significantly to it. Agriculture uses some 70 per cent of global freshwater and 40 per cent of global land area. Today, more than ever before, we understand not only the significance that climate has for agriculture, but also the enormous significance that agriculture has for the climate. Agriculture is the world's leading source of methane and nitrous oxide emissions, a substantial source of carbon emissions, and the principal driver of deforestation worldwide. Direct emissions from agriculture account for 10-12 per cent of total global greenhouse gas emissions. Including emissions from land use change, such as from deforestation to gain cropland, this share rises to 20-30 per cent.

Organic agriculture performs favorably regarding greenhouse gas emission categories. Organic agriculture usually uses 20 to 50 per cent less fossil energy per hectare and per unit produce than conventional agriculture. Organic agriculture is a low-cost and effective way to help many of the world's poorest people to have good levels of nutrition and a better quality of life.

Mobilization of donor community

Food insecurity and climate change have finally brought agriculture back into the spotlight of international development debate. For all to have enough food, productivity on existing farmlands must rise, purchasing power of those in need must increase, and agriculture must be environmentally sustainable. A climate-smart agriculture with a focus on improved productivity, enhanced resilience and reduced greenhouse gas emissions is urgently required.

The vulnerability of agriculture to climate variability and change is an issue of major importance to the international donor community.

Interest rate subsidies and other ways of blending grants and loans can leverage investments by international financial institutions in the fields of environment and agriculture.

Dr. Henry Kerali the World Bank's Regional Director for the South Caucasus stated that *"Agriculture is the backbone of the Southern Caucasus rural economy, and it is among the most climate-sensitive of all economic sectors. Armenia, Azerbaijan and Georgia have faced significant changes in climate in recent years, and The World Bank is focusing on examining the effect of climate change on the agricultural sector in these countries and assisting them in developing mitigation strategies."*

According to World Bank report (1) about 8 out of 10 of the rural poor in the South Caucasus countries bank on agriculture for their daily livelihood. Agriculture is the single most productive sector for the South Caucasus countries, and an important contributor to their GDP - in 2010, that number was 20% for Armenia, 6% for Azerbaijan and 8% for Georgia.

In recent years, Armenia, Azerbaijan and Georgia have faced significant changes in climate: rising temperatures, shrinking glaciers, sea level rise, reduction and redistribution of river flow, to name

a few. Additionally, the region has also been subjected to natural disasters such as flooding, forest fires and landslides, resulting in economic and human loss.

It is going to be generally warmer in the South Caucasus countries, with summers predicted to be drier and droughts to be more severe. A change in rain pattern is also affecting farming and livestock. These issues spell a tough future for the rural population in these countries, given their limited ability to deal with the changing climate and its effect on their agricultural activity. That, in turn, will make it tougher to combat poverty, income equality and access to food.

In the “European Neighborhood and Partnership Instrument” country strategy paper for Armenia was being mentioned that Armenia faces significant challenges in order to promote environmental protection. Key areas include air quality, water quality and supply, waste management, nature protection, land use, industrial pollution, trans-boundary environment issues and climate change including multilateral environmental agreements. Institutional and administrative capacities exist but could be further strengthened, in particular as regards implementation and enforcement of legal provisions.

As regards **global environment issues and climate change in particular**, Armenia acceded to the Kyoto Protocol in April 2003 and therefore needs to implement the relevant provisions and, where appropriate, implement concrete policies and measures to reduce greenhouse gas emissions, in particular in the energy and heavy industry sectors. With regard to **land use, soil erosion, mainly caused by poor agricultural practices and overgrazing**, constitutes a challenge. A large part of the country is subject to desertification.

According to “The Second National Environmental Action Program” published by The Ministry of Nature Protection of the Republic of Armenia, bio-resources are key factors that support the economy of the country, in particular in terms of agriculture and recreation, as well as in terms of provision of raw materials to the food industry and other industrial sectors. Economic changes taking place in recent decade have had their significant impact on the biodiversity. Being concerned with the current situation, the RA Government has included the issue of prevention of ecosystems and bio-diversity degradation among the priorities of the country.

USDA was a pioneer among the donor organizations in Armenia who promoted and coordinated organic movement in Armenia in 2000-2001. “Shen”, EcoGlob and later on Green Lane have been successfully introducing organic agriculture practices in Armenia: They actively support the development of climate smart sustainable agriculture by spreading the organic agriculture cultivation methods among farmers and food processing.

Concluding remarks

Global agriculture is at a crossroads. Hunger remains one of the most pervasive development challenges facing humanity. In this era of climate change, efforts to tackle food requirement must go hand in hand, because the fact remains that high world market prices are first of all a threat to food security for the world’s poorest countries, and consequently a threat to social stability. Organic agriculture holds significant promise for addressing climate change mitigation, increasing food production and enhancing environmentally friendly agriculture.

One of the key factors is a change towards a more climate smart agriculture. We all should stand together and tell that we are for a greener future. Most importantly, the donors urgently need to

increase the training in good organic practices to ensure that the poorest smallholder farmers can have the increases in yield that are needed to achieve food security. Let's explain to our families, farmers, colleagues and partners why to support the knowledge based organic production in Armenia.

References

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3. “European Neighborhood and Partnership Instrument” country strategy paper for Armenia (Pages 12-28). http://ec.europa.eu/world/enp/pdf/country/enpi_csp_armenia_en.pdf
4. “The Second National Environmental Action Program”. The Ministry of Nature Protection of the Republic of Armenia (page 24). <http://www.natureic.am/res/pdfs/documents/strategic>